

PATENT
AUS9-2000-0285-US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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In Re Application of:)
Tai Anh Cao et al.)
Serial No.: 09/640,802) Group Art Unit: 2634
Filed: August 17, 2000)
FOR: CIRCUIT FOR FACILITATING) Examiner: Ted M. Wang
SIMULTANEOUS MULTI-)
DIRECTIONAL TRANSMISSION)
OF MULTIPLE SIGNALS)
BETWEEN MULTIPLE CIRCUITS) Facsimile No.: (703) 872-9306
USING A SINGLE TRANSMISSION)
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APPEAL BRIEF

This is an appeal from the Final Office Action mailed June 18, 2004, rejecting Claims 1 through 11, 13 through 15, and 18. Appellants submit this Appeal Brief to the Board of Patent Appeals and Interferences within the two-month period following the Notice of Appeal filed October 15, 2004.

This Appeal Brief is accompanied by an authorization (Fee Transmittal form PTO/SB/17) to charge Deposit Account No: 09-0447 for the fee of \$500.00 due under 37 C.F.R. §41.20(b)(2).

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1 **I. REAL PARTY IN INTEREST (37 C.F.R. §41.37(c)(1)(I))**

2 The above-described patent application is assigned to International Business Machines
3 Corporation ("IBM"), the real party in interest.

4
5 **II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. §41.37(c)(1)(ii))**

6 There is no related Appeal or Interference before the United States Patent and Trademark
7 Office.

8
9 **III. STATUS OF THE CLAIMS (37 C.F.R. §41.37(c)(1)(iii))**

10 The status of the claims is as follows:

11 Allowed Claims:	None
12 Claims to which Objections apply:	12 and 16
13 Claims withdrawn from consideration:	None
14 Claims Rejected:	1 through 11, 13 through 15, and 18
15 Claims Appealed:	1 through 16, and 18

16
17 **IV. STATUS OF AMENDMENTS (37 C.F.R. §41.37(c)(1)(iv))**

18 The claim amendments filed July 21, 2004, in response to the June 18, 2004 Final Office
19 Action have not been entered as indicated by the Advisory Action mailed October 4, 2004. The
20 claims reproduced in the accompanying Claims Appendix reflect the state of claims 1 through
21 16, and 18 as they currently stand in this case.

1 Please note that the last claim in the original set of claims filed in this case was
2 misnumbered as claim 18. The Appellants attempted to correct this error in the response filed
3 May 14, 2004, and in the response after final office action filed July 21, 2004. However, none of
4 the amendments filed by the Appellants to correct this error appear to have been entered in the
5 case. Therefore, there is no claim 17 for the Board to consider on appeal.
6

7 **V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. §41.37(c)(1)(v))**

8 The present invention includes an electronic circuit 104 adapted to communicate a signal
9 to a plurality of additional electronic circuits 105 and 106 over a common transmission line 108
10 while simultaneously receiving additional signals from the plurality of additional electronic
11 circuits 105 and 106 over the common transmission line 108 (p. 7, lines 6-13). The electronic
12 circuit 104 includes signal sending circuitry DRIVER A and encoder 109 coupled to an interface
13 node 117 which is adapted to be coupled to the common transmission line 108 (p. 7, lines 24-26;
14 p. 8, lines 5-7). The signal sending circuitry DRIVER A and encoder 109 is for applying a signal
15 from the electronic circuit 104 to cooperate in creating a combined signal at the interface node
16 117 (p. 10, line 24 - p. 11, line 2; p. 11, lines 21-23). This combined signal is dependent upon
17 the signal from the electronic circuit 104 and the additional signals simultaneously applied by the
18 plurality of additional electronic circuits 105 and 106 connected at other points 118 and 119 on
19 the common transmission line 108 (p. 10, line 24 - p. 11, line 2; p. 8, lines 7-9). The electronic
20 circuit 104 also includes decoding circuitry 110 coupled to the interface node 117 (p. 7, line 26 -
21 p. 8, line 7). This decoding circuitry 110 detects the combined signal at the interface node 117

1 and decodes the additional signals from the combined signal (p. 9 lines 5-20; p. 7, line 26 - p. 8,
2 line 7).

3 The present invention also includes an electronic circuit arrangement 100 including three
4 or more circuits 104, 105, and 106 connected together by a common transmission line 108, where
5 each circuit 104, 105, and 106 is adapted to assert a respective digital signal (p. 7, lines 6-13).
6 Each circuit 104, 105, and 106 includes respective sending circuitry DRIVER A and encoder
7 109, DRIVER B and encoder 111, DRIVER C and encoder 113 connected to the common
8 transmission line 108 and this sending circuitry cooperates to produce an encoded signal on the
9 transmission line 108 based upon the values of the respective digital signals asserted by the
10 respective circuits 104, 105, and 106 (p. 7, line 24 - p. 8, line 9; p. 10, line 24 - p. 11, line 2).
11 The encoded signal comprises one signal from a set of unique encoded signals. Each different
12 signal in the set of encoded signals is representative of a particular combination of digital signals
13 asserted simultaneously from the respective circuits 104, 105, and 106 (p. 11, lines 21-23). Each
14 circuit 104, 105, and 106 also includes a respective decoding arrangement 110, 112, and 114 for
15 decoding the encoded signal appearing on the common transmission line 108 to produce the
16 digital signals asserted from each other circuit 104, 105, and 106 (p. 8, lines 14-23).

17
18 **Means Plus Function Expressions**

19 Claim 1 elements (a) and (b), claim 7 elements (b) and (c), and claim 13 elements (a) and
20 (b) include means plus function expressions under 35 U.S.C. 112, paragraph six.
21

Claim 1

Claim 1 element (a) includes the means plus function expression, "...the signal sending circuitry for applying a signal from the electronic circuit to cooperate in creating a combined signal at the interface node." The structure of the signal sending circuitry of element (a) includes a DRIVER A and encoding element 109 for circuit 104, DRIVER B and encoding element 111 for circuit 105, and DRIVER C and encoding element 113 for circuit 106 (Figures 1-4 and p. 7, line 24 - p. 8, line 5). The encoding elements 109, 111, and 113 are shown as resistors Ra, Rb, Rc, respectively, in Figures 2, 3 and 4 (p. 8, line 26 - p. 9, line 3).

Element (b) of claim 1 includes the means plus function expression, "...the decoding circuitry for detecting the combined signal at the interface node and decoding the additional signals from the combined signal..." Figure 1 shows the decoding circuitry at 110 for circuit 104, at 112 for circuit 105, and at 114 for circuit 106 (p. 7, line 26 - p. 8, line 5). Figure 2 shows a particular decoding circuit 110 made up of a second signal decoding arrangement 201 and a third signal decoding arrangement 204 (p. 9, lines 5-20). Figure 3 shows a particular decoding circuit 112 made up of a first signal decoding arrangement 301 and a third signal decoding arrangement 303 (p. 9, line 21 - p. 10, line 8). Figure 4 shows a particular decoding circuit 114 made up of a first signal decoding arrangement 401 and a second signal decoding arrangement 403 (p. 10, lines 9-23).

Claim 7

Claim 7 element (b) includes the means plus function expression, "...the sending circuitry of the respective circuits cooperating to produce an encoded signal on the transmission line based

1 upon the values of the respective digital signals asserted by the respective circuits.” The
2 structure of the sending circuitry of element (b) includes a DRIVER A and encoding element 109
3 for circuit 104, DRIVER B and encoding element 111 for circuit 105, DRIVER C and encoding
4 element 113 for circuit 106 (Figures 1-4 and p. 7, line 24 - p. 8, line 5). The digital signal
5 encoding elements 109, 111, and 113 are resistors Ra, Rb, Rc, respectively, in Figures 2, 3, and 4
6 (p. 8, line 26 - p. 9, line 3).

7 Claim 7 element (c) includes the means plus function expression, “...a decoding
8 arrangement for decoding the encoded signal appearing on the common transmission line to
9 produce the digital signals asserted from each other circuit.” Figure 1 shows the decoding
10 circuitry at 110 for circuit 104, at 112 for circuit 105, and at 114 for circuit 106 (p. 7, line 26 - p.
11 8, line 5). Figure 2 shows a particular decoding circuit 110 made up of a second signal decoding
12 arrangement 201 and a third signal decoding arrangement 204 (p. 9, lines 5-20). Figure 3 shows
13 a particular decoding circuit 112 made up of a first signal decoding arrangement 301 and a third
14 signal decoding arrangement 303 (p. 9, line 21 - p. 10, line 8). Figure 4 shows a particular
15 decoding circuit 114 made up of a first signal decoding arrangement 401 and a second signal
16 decoding arrangement 403 (p. 10, lines 9-23).

17
18 Claim 13

19 Claim 13 element (a) includes the means plus function expression, “...the first, second,
20 and third encoding elements cooperating to produce an encoded signal on the common
21 transmission network based upon the values of the first, second, and third digital signals.” The

1 first, second, and third encoding elements 109, 111, and 113 are resistors Ra, Rb, Rc,
2 respectively, in Figures 2, 3, and 4 (p. 8, line 26 - p. 9, line 3).

3 Element (b) of claim 13 includes the means plus function expression, "...the decoding
4 arrangement for each respective circuit for decoding the encoded signal to produce the digital
5 signals produced by each other circuit in the system." Figure 1 shows the decoding circuitry at
6 110 for circuit 104, at 112 for circuit 105, and at 114 for circuit 106 (p. 7, line 26 - p. 8, line 5).
7 Figure 2 shows a particular decoding circuit 110 made up of a second signal decoding
8 arrangement 201 and a third signal decoding arrangement 204 (p. 9, lines 5-20). Figure 3 shows
9 a particular decoding circuit 112 made up of a first signal decoding arrangement 301 and a third
10 signal decoding arrangement 303 (p. 9, line 21 - p. 10, line 8). Figure 4 shows a particular
11 decoding circuit 114 made up of a first signal decoding arrangement 401 and a second signal
12 decoding arrangement 403 (p. 10, lines 9-23).

13
14 **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**
15 **(37 C.F.R. §41.37(c)(1)(vi))**
16

- 17 1. Claims 1 through 3, 7, 9, 13, and 14 stand rejected under 35 U.S.C. §102(b) as being
18 anticipated by U.S. Patent No. 3,993,867 to Blood (the "Blood patent" or "Blood").
- 19 2. Claims 4 through 6, 8, 10, 11, 15, and 18 stand rejected under 35 U.S.C. §103(a) as being
20 obvious over the Blood patent in view of U.S. Patent No. 5,761,246 to Cao et. al. (the "Cao
21 Patent" or "Cao").
- 22 3. Claims 12 and 16 are objected to as being dependent upon rejected base claims 7 and 13,
23 respectively.

1 **VII. ARGUMENT (37 C.F.R. §41.37(c)(vii))**

2 A. REJECTIONS UNDER 35 U.S.C. §102(b) OVER THE BLOOD REFERENCE
3

4 The Appellants respectfully submit that the rejection of claims 1 through 3, 7, 9, 13, and
5 14 under 35 U.S.C. §102(b) as being anticipated by the Blood patent is in error. A claim is
6 anticipated only if each and every element as set forth in the claim is disclosed, either expressly
7 or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814
8 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Since the Blood patent does not teach
9 or suggest each and every element of claims 1 through 3, 7, 9, 13, and 14, these claims are not
10 anticipated by this reference.

11
12 Claims 1 through 3

13 Claim 1 is directed to an electronic circuit connected to a number of other additional
14 circuits over a common transmission line. Element (a) of claim 1 requires sending circuitry for
15 applying a signal that cooperates with signals applied by the additional circuits to create a
16 combined signal that is “dependent upon the signal from the electronic circuit and the additional
17 signals simultaneously applied by the plurality of additional electronic circuits connected at other
18 points on the common transmission line.” Element (b) of claim 1 requires decoding circuitry for
19 “decoding the additional signals from the combined signal.” This claim language clearly requires
20 a circuit that is capable of producing a signal that cooperates with signals from two or more
21 additional circuits (for a total of at least three signals, one being sent and a plurality (two or
22 more) being received) to simultaneously create a combined signal on a common transmission

1 line. The required circuit must also decode the plurality of additional signals from the combined
2 signal in order to receive the two or more additional signals asserted from the two or more
3 additional circuits.

4 In contrast, the Blood patent discloses a circuit that is capable of simultaneously sending
5 a signal to and receiving a signal from only one additional circuit. Figures 1 and 2 of the Blood
6 patent clearly show only two sending and receiving stations connected to a common transmission
7 line. Although Figure 5 of the Blood patent shows a plurality of sending and receiving stations
8 connected to a single transmission line, the patent clearly states at Col. 7, lines 2-4 that only a
9 selected pair of stations A....N in Figure 5 may provide simultaneous two-way communication
10 over the common transmission line. References in the sentences beginning at Col. 7, lines 13-25
11 confirm that the circuit disclosed in the Blood patent is capable of simultaneously sending a
12 signal to and receiving a signal from only one additional circuit and not a plurality of additional
13 circuits.

14 This limitation in the circuit disclosed in the Blood patent, facilitating only bi-directional
15 communications between two circuits, is readily borne out in the circuit structure itself as shown
16 in Figures 2 and 4 of the Blood patent. These figures clearly show that each sending and
17 receiving station includes only a single receiver R1 receiving a single signal. This received
18 signal is shown at line P in Figure 3 of the Blood patent. The sending and receiving stations
19 shown in the Blood patent include no structure for decoding or receiving a second signal from an
20 encoded signal on the common transmission line. Thus, it is simply not possible for the
21 receiving circuitry of the Blood patent to decode more than one additional signal from the
22 common transmission line. Yet element (b) of Appellants' claim 1 clearly requires that the

1 electronic circuit decode a plurality of additional signals from the combined signal, not merely
2 one additional signal from the combined signal.

3 Because the Blood patent does not teach or suggest all of the elements required in claim
4 1, claim 1 is not anticipated by the Blood patent and is entitled to allowance together with all of
5 its respective dependent claims, including claims 2 and 3.

6
7 Claims 7 and 9

8 Independent claim 7 requires "three or more circuits connected together by a common
9 transmission line, each circuit adapted to assert a respective digital signal." As set out at element
10 (b) of claim 7, each circuit includes sending circuitry that cooperates with the sending circuitry of
11 the other circuits (at least two other circuits since there is a total of three or more) to produce an
12 encoded signal on a common transmission line. Element (c) of claim 7 requires that each of the
13 three or more circuits includes a decoding arrangement for decoding the encoded signal to
14 produce the signals asserted from each other circuit, that is, at least two other circuits.

15 As discussed above with respect to claim 1, the Blood patent only discloses an
16 arrangement in which a pair of transmitter/receiver units can have simultaneous bi-directional
17 communications. The circuits disclosed in the Blood patent are incapable of simultaneously
18 transmitting to and receiving from two other circuits on a common transmission line, as required
19 by claim 7.

20 Because the Blood patent does not teach or suggest all of the elements required in claim
21 7, claim 7 is not anticipated by the Blood patent and is entitled to allowance together with its
22 respective dependent claims, including claim 9.

1 Claims 13 and 14

2 Independent claim 13 is directed to an electronic system with three circuits. Claim 13
3 requires that each circuit include a respective encoding element which cooperates with the
4 encoding elements of the other two circuits to produce an encoded signal on a common
5 transmission network. Furthermore, claim 13 requires that each circuit include a respective
6 decoding arrangement for decoding the encoded signal to produce the signal from each of the
7 other two circuits in the system. The arguments presented above with respect to claims 1 and 7
8 apply equally to claim 13. Since the Blood patent only discloses an arrangement in which two
9 transmitter/receiver circuits can have simultaneous bi-directional communications, and does not
10 disclose or suggest any structure for providing multidirectional simultaneous communications
11 between three circuits as required in claim 13, claim 13 cannot be anticipated by the Blood
12 patent.

13 Because the Blood patent does not teach or suggest all of the elements required in claim
14 13, claim 13 is not anticipated by the Blood patent and is entitled to allowance together with its
15 respective dependent claims, including claim 14.

16
17 B. REJECTIONS UNDER 35 U.S.C. § 103 OVER THE BLOOD PATENT IN VIEW OF
18 THE CAO PATENT

19
20 The Appellants respectfully submit that claims 4 through 6, 8, 10, 11, 15, and 18 are not
21 obvious in view of the Cao patent on the ground that the references do not teach or suggest each
22 element required in the claims.

1 Claims 4 through 6, 8, 10, 11, 15, and 18

2 In the obviousness rejections, the Examiner relied on the Blood patent for showing the
3 elements of the independent claims and cited the Cao patent only for elements added in the
4 respective dependent claim. As discussed above, however, the Blood patent does not teach or
5 suggest each and every limitation of the dependent claims. In particular, Blood does not teach or
6 suggest a circuit that is capable of sending a signal along a transmission line and simultaneously
7 receiving signals from two or more other circuits connected to the transmission line. The Cao
8 patent does not make up for this deficiency in the Blood patent. Specifically, the Cao patent does
9 not teach or suggest a circuit that is capable of simultaneously sending a signal along a
10 transmission line and receiving two or more signals from that same transmission line. In
11 contrast, the Cao patent discloses an arrangement for unidirectional communication between an
12 encoding circuit and a decoding circuit. The encoding circuit of the Cao patent simultaneously
13 transmits a number of encoded signals over a single signal transmission line to the decoding
14 circuit. However, any transmissions sent from the decoding circuit to the encoding circuit must
15 be sent on a separate transmission line.

16 Because neither the Blood patent nor the Cao patent teach or suggest a circuit that is
17 capable of sending a signal along a transmission line and simultaneously receiving two or more
18 signals from the same transmission line as required in each of the independent claims, and
19 because the teachings of the Blood and Cao references cannot be combined in any way to teach
20 or suggest such a circuit, the claims of this case cannot be obvious over the Blood patent in view
21 of the Cao patent. Therefore, all of the claims in this case, including claims 4 through 6, 8, 10,

1 11, 15, and 18 are not obvious over the Blood patent in view of the Cao patent, and are entitled to
2 allowance.

3
4 C. OBJECTIONS TO CLAIMS 12 AND 16

5 Claims 12 and 16 were objected to by the Examiner for being dependent on a rejected
6 base claim, claims 7 and 13 respectively. Aside from dependence upon a rejected base claim, the
7 Examiner indicated that the subject matter of claims 12 and 16 was allowable. Therefore, since
8 independent claims 7 and 13 are entitled to allowance as discussed above, dependent claims 12
9 and 16 are also entitled to allowance.

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VIII. CONCLUSION

For all of the above reasons, the Appellants submit that claims 1 through 16, and 18 are entitled to allowance, and respectfully request that the Board reverse the decision of the Examiner rejecting these claims.

Respectfully submitted,

The Culbertson Group, P.C.

Date: December 14, 2004

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, (Facsimile No. 703-872-9306) on December 14, 2004.

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